

REMARKS/ARGUMENTS

Applicant appreciates the Examiner's thorough search with respect to the present patent application.

Claims 1 and 10 have been amended to correct obvious typographical errors. Applicant respectfully submits that the changes to the claims make explicit that which applicant believed was already implicit and, therefore, are not made for purposes related to patentability.

Claim 10 stands rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, the Examiner states that the phrase "the heat sensor" is unclear. Accordingly, claim 10 has been amended to overcome the Examiner's rejection under 35 U.S.C. §112, second paragraph.

Claims 1, 2, 5-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi et al. ("Kobayashi", U.S. Patent No. 5,998,863). Applicant respectfully traverses this rejection.

In the Office Action, the Examiner cites Kobayashi as disclosing a heat sink circuit that comprises at least one U-shaped aluminum tube with open ends, a sealed vacuum vessel with orifices into the vessel communicating with the open ends of the tubes, fibers which are strongly absorbent and are impregnated with a refrigerant liquid disposed in the vessel. Applicant respectfully disagrees.

Applicant's independent claim 1 requires "fibers which are strongly absorbent and are impregnated with a refrigerant liquid..." Impregnation requires a liquid be absorbed in the fibers, not imply passing by or around the fibers.

Kobayashi is directed to a cooling apparatus that includes a refrigerant tank to which a semiconductor device is attached. Applicant respectfully submits that the Examiner has incorrectly identified the inner fins 21 of Kobayashi to make obvious the fibers 3 of applicant's claim 1. Column 6, lines 1-4 of Kobayashi describes "...inner fins 21 can be formed easily by (perforating a flat tube...) simultaneously when the tubular member is extruded..." Those "fins" are seen in several drawings, including Figs. 2 and 6. They are fin like panels, nothing filament

like, and as described, they are not capable of absorbency or particularly strong absorbency for refrigerant liquid.

M.P.E.P. §2111.01 says that words of a claim must be given their “plain meaning” unless they are defined in the specification. The term “fibers” does not appear to be defined in applicant’s specification. The term “fiber” is defined in Merriam Webster’s Dictionary as, *inter alia*, a thread, a filament, a strand or the like. The fibers 3 shown in Figs. 1 and 2, and described in applicant’s written specification, appear to be consistent with the dictionary definition, and they are absorbent and liquid impregnated. In accordance with Webster’s dictionary, a “fin” is defined, *inter alia*, as a projecting rib on a radiator or an engine cylinder. Applicant respectfully submits that Kobayashi’s fins 21, parenthetically referred to as a “heat transfer member,” as shown in Figs. 1-28B are shown as a rib and therefore patentably distinct from applicant’s fibers 3. Kobayashi’s fins 21 are not thread-like, filament-like or strand-like and absorbency or impregnation of fins is not suggested in Kobayashi. Accordingly, applicant respectfully submits that Kobayashi does not teach or suggest an element of applicant’s claim 1.

Furthermore, claim 1 recites “at least one U-shaped copper tube...” The specification at page 1 says that aluminum heat sinks have lesser performance than copper ones would. The Examiner recognizes that Kobayashi does not disclose that tube 41 is made from copper. However, the Examiner concludes it would have been obvious to one having ordinary skill in the art to substitute the aluminum tube in the cooling system of Kobayashi to any known metal, including copper, as long as it is compatible with the requirements of other elements in the circuit in order to properly cool heat generating components in electrical devices. The Examiner cites to In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) for supporting the position that discovering an optimum value of a result effective variable involves only routine skill in the art. Applicant respectfully disagrees with the Examiner’s conclusion.

Applicant’s claim 1 recognizes the shortcomings of prior art cooling devices that are constructed of aluminum alloys and relies upon the benefits of constructing U-shaped tubes that are made of copper. Applicant notes that the cost of a prior art heat sink manufactured from copper would be exorbitant and, therefore, unsatisfactory. Therefore in designating copper, applicant is suggesting acting contrary to conventional wisdom, using and claiming a more

expensive material. Its selection is thus non-obvious. Applicant's claim 1 provides a novel heat sink that comprises U-shaped copper tubes that efficiently disperse heat and which is compact, light in mass, and cost effective. Applicant respectfully submits that the Examiner's conclusion that it would be obvious to one skilled in the art to substitute the metal of the tube from aluminum to any known metal, including copper, is arbitrary and not supported by Kobayashi because Kobayashi sets out to solve a different problem of inefficient circulation of a refrigerant liquid. Of course, metal is metal. But when one provides a benefit in a claimed combination of applicant's claim 1 then the combination is unobvious and patentable. Therefore, one skilled in the art would not find it obvious to modify the heat sink of Kobayashi by substituting likely more expensive copper tubes for less expensive aluminum tubes because the problem solved by Kobayashi relates to improper circulation of a refrigerant liquid, and not the limitations of aluminum with respect to heat dispersion.

Even assuming, *arguendo*, that it would be obvious to substitute copper for aluminum in applicant's heat sink, applicant's claim 1 still would not be suggested because Kobayashi does not teach or suggest using fibers for absorbing a refrigerant liquid. Therefore, Applicant respectfully submits that claim 1 is allowable over Kobayashi.

Claims 2, 5-9 are allowable for the same reasons, as well as because of the combination of features set forth in those claims with the features set forth in the claim(s) from which they depend.

Claims 3 and 4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi in view of Tajima (U.S. Patent No. 5,647,430). The Examiner states that Kobayashi discloses all of the limitations of claim 1, but does not disclose an externally mounted cooling fan and supporting frame. Applicant respectfully traverses this rejection.

Applicant respectfully submits that Tajima does not teach or suggest the elements of applicant's claim 1 that are missing from Kobayashi. More particularly, Tajima does not teach or suggest the use of fibers 3 that are impregnated with a refrigerant liquid. Further, Tajima does not teach or suggest the use of at least one U-shaped tube made of copper. Applicant respectfully submits that even assuming, *arguendo*, one were to combine the teachings of Kobayashi and

Tajima, applicant's claims still would not be suggested. Accordingly, applicant respectfully submits that claims 3 and 4 are allowable over the combination of Kobayashi and Tajima.

Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi in view of Kyees (U.S. Patent No. 5,743,107). The Examiner states that Kobayashi discloses all of the limitations of claim 1 except for the refrigerant liquid being a glycol, that Kyees discloses use of a refrigerant liquid as glycol, and that it would have been obvious to one having ordinary skill in the art to modify the refrigerant liquid in the cooling system of Kobayashi with a glycol liquid as taught by Kyees in order to cool down heat generated components in the device.

Applicant respectfully disagrees.

Applicant respectfully submits that, as noted above with respect to the combined teachings of Kobayashi and Tajima, Kyees also does not suggest the elements of applicant's independent claim 1 particularly, use of fibers that are impregnated with a refrigerant liquid or use of at least one U-shaped tube that is made of copper. Combining the glycol liquid taught by Kyees with the teachings of Kobayashi, applicant's invention still would not be suggested.

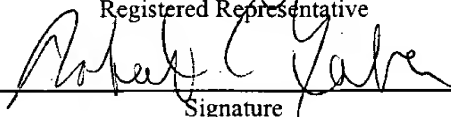
Applicant respectfully submits that claim 10 is allowable over the cited references.

For the foregoing reasons, applicant respectfully submits that claims 1-10 are in condition for allowance.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 2, 2004:

Robert C. Faber

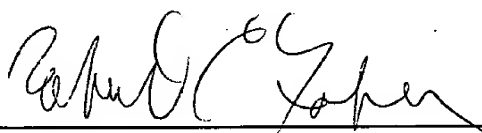
Name of applicant, assignee or
Registered Representative


Signature

January 2, 2004

Date of Signature

Respectfully submitted,



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